

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. APPLN. NO. 10/542,636

REMARKS

Examiner Nguyen issues the following four (4) statutory prior art rejections:

- (1) Claims 13, 19, 22, 23, 29 and 32 are rejected under 35 U.S.C. § 102(b) as being anticipated by (lacking novelty over) Hansen '560;
- (2) Claims 14-17 and 24-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable (obvious) over Hansen in view of Schoess '819;
- (3) Claims 20 and 30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hansen in view of Pchelnikov '142; and
- (4) Claims 21 and 31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hansen in view of Klun '521.

Applicant respectfully traverses each of these rejections insofar as they may be applied to the amended claims 13-17, 19-27 and 29-32.

First, and with reference to paragraph 8 spanning pages 8 and 9 of the Office Action, Applicant rewrites dependent claims 18 and 28 in independent form, whereby Applicant respectfully requests the Examiner now to **allow claims 18 and 28**.

Rejection (1), based on anticipation, requires that Hansen disclose, either expressly or inherently, each limitation of each of the rejected claims 13-19, 22, 23, 29 and 32, or in other words, that each of these claims be **readable** on Hansen's disclosure. Applicant respectfully submits that clearly such is **not** the case here with respect to the amended claims.

The independent claims 13 and 23 have been amended to require a gap of "between 10nm and 1mm". Clearly, these claims are **not readable** on Hansen which, therefore, is **incapable of**

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anticipating these claims. Thus, Applicant respectfully requests the Examiner to reconsider and withdraw rejection (1) above.

The recited gap range is **critical**. To forestall a shift in the rejection (1) to one based on unpatentability (obviousness), Applicant now explains why the claimed gap range is "critical".

The measuring device according to the invention comprises a sensor including a pair of electrodes spaced apart from each other and to be immersed in cooking ("food") oil of a deep fryer, whose quality and/or degradation one wishes to measure to determine whether it is still fit for use. Each electrode of the pair has the shape of a comb having a plurality of teeth substantially parallel to each other and extending from a base. The two electrodes are arranged in relation to each other such that teeth of one electrode are interdigitized with the teeth of the other electrode, leaving an air gap between adjacent teeth. The teeth of each of the two electrodes are arranged in substantially the same plane.

The two electrodes form with cooking ("food") oil a capacitive measuring element whose capacitance varies as a function of the dielectric constant of the cooking oil. When the cooking oil is degraded, the quantity of polar fatty acid compounds present in the cooking oil increases and causes an increase in its dielectric constant. Thus, by measuring the evolution of the capacitance of the capacitive measuring element, the degree of quality and/or degradation of the oil can be determined. The sensor is, thus, capable of providing an electrical output signal representative of the dielectric constant of the cooking oil over a wide temperature range.

Since the polar fatty acid compounds are mixed with non-conductive particles, a measurement of the variation of the dielectric constant of the cooking oil requires an air between

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from 10nm and 1mm to give a sufficient dielectric constant variation than can be detected. (The polar fatty acids modify the dielectric constant without short circuits risks because of the size of the particles and because of the fact that "food oil" is naturally an insulating material.)

With air gaps larger than 1mm, no variation of the dielectric constant of the cooking oil can be measured, and therefore no degradation of the cooking oil can be detected.

Hansen '560 discloses a sensor for monitoring fluid conditions such as hydraulic fluids, lubricants etc. used in power transmission devices and combustion engines. First of all, Hansen '560 does not disclose or even suggest any dimensions for the air gap for the interdigitated electrodes shown in Figures 1 and 2. Moreover, the type of fluids involved in the suggested uses contains conductive metallic powder particles, the dimensions of some of which easily exceed 1mm, which, therefore, would require the use of air gaps well above Applicant's claimed range to avoid any chance of short-circuiting the electrodes, and to obtain a valid measurement.

Therefore, we believe that Hansen '560 does not give any valid teaching towards the provision of sensing electrodes having the shape of a comb with interdigitated teeth and an air gap having a length between 10nm and 1mm.

Therefore, since Hansen '560 does not teach or even suggest sensing electrodes having a shape of a comb with interdigitated teeth and an air gap having a length between 10nm and 1mm, Applicant respectfully submits that the independent claims 13 and 23 (and their respective dependent claims) would not have been obvious from Hansen and any of the secondary references, because these documents, taken alone or in any combination, do not disclose or even suggest **all of the limitations** of claims 13-17, 19-27 and 29-32.

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Thus, Applicant also respectfully requests the Examiner to reconsider and withdraw rejections (2), (3) and (4) above. The secondary references Schoess '819, Pchelnikov '149 or Klun '521, taken in any combination, do not teach or even suggest the **critical gap range** now required by the independent claims 13 and 23.

Thus, Applicant also respectfully requests the Examiner to reconsider and withdraw the three rejections under 103(a).

In summary, then, and for the reasons presented above, Applicant respectfully requests the Examiner to reconsider and withdraw all rejections, and to find the application to be in condition for allowance with claims 13-17, 19-27 and 29-32, together with the **already allowable** claims 18 and 28.

Applicant files concurrently herewith an Excess Claim Fee Payment letter to cover the cost of the one excess independent claim created by this Amendment.

Applicant also files concurrently herewith a Petition (with fee) for an Extension of Time of three months (small entity). Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this application, and any required fee for such extension

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is to be charged to Deposit Account No. 19-4880. The Commissioner is also authorized to charge any additional fees under 37 C.F.R. § 1.16 and/or § 1.17 necessary to keep this application pending in the Patent and Trademark Office or credit any overpayment to said Deposit Account No. 19-4880.

Respectfully submitted,

/John H. Mion/
John H. Mion
Registration No. 18,879

SUGHRUE MION, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, D.C. 20037-3213
(202) 663-7901

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: February 20, 2008